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Bio-Fuels

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Report Highlights:
Escalating palm oil prices have dampened the fledging biodiesel industry in Malaysia. The Government put on hold the proposed mandatory blend of 5 percent of palm olein in diesel. However, foreign companies continue to invest in this sector, reflecting optimism in its long term prospects. Domestic consumption of biodiesel will be low, as most all of the production will be exported, mainly to the European Union and United States. With palm oil prices breaching new record highs, Jatropha looks to be a promising alternative feedstock.

Includes PSD Changes: No
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Executive Summary

With the rocketing crude palm oil (CPO) prices and subsidized retail petroleum diesel in the domestic market, some investors have put on their brakes to go ahead with their biodiesel plant construction plans. A couple of plants have suspended production to avoid incurring losses. In the meantime, the Government of Malaysia (GOM) put on hold the proposed mandatory blend of 5 percent of palm olein in diesel in the domestic market.

Overseas markets remain attractive given the sharp increase in petroleum products and other bio-fuel feedstock. However, the EU's concerns over negative impacts of oil palm cultivation on environment and land-use have raised fears of possible banning of palm oil based biodiesel going into the EU.

Malaysia's palm biodiesel industry continues to attract foreign investors, the latest being a tripartite venture involving Malaysia, Uganda and Libya to construct a biodiesel plant which a production capacity of 250,000 ton per annum in Negri Sembilan, Peninsular Malaysia. The target markets for all the new projects are all overseas, particularly in Europe, the United States and South Korea. The development of the industry is benefiting from the strong support of the Government of Malaysia (GOM) which provides incentives.

Opportunities for US exports of biofuel or a biofuel feedstock to Malaysia are limited as the country already has in oil palm a plentiful feedstock. Also, retail petroleum prices in Malaysia are subsidized, diminishing the economic viability of importing biofuels as an alternative fuel source.

Jatropha, a tough bush with oil bearing fruit has excellent small-scale potential but needs more research before it could be cultivated on a larger-scale area. The shrub grows on marginal and arid land and needs little care. *Jatropha* is non-edible, so avoiding the food vs fuel controversy.

Exchange Rate: US$1=RM 3.20 (May 23, 2008)

BIO-FUEL POLICY

Policies supporting production and use of biofuels

Malaysia, with its large and growing palm oil industry, has the potential to play a major role in the world biofuel market. Malaysia is currently the world's number two producer and remains the top exporter of palm oil. Oil palm has the highest oil yield per hectare of all vegetable oil feedstocks, seven times greater than that of soybeans and three times that of rapeseed.

Processed liquid palm oil (PLPO) can be used directly to power normal diesel engines or may be blended with petroleum diesel. Palm oil can also be converted to methyl esters (biodiesel) through a process called transesterification. This process combines refined palm oil, methanol, and a catalyst (sodium hydroxide) to produce the methyl esters. These methyl esters have performance characteristics similar to those of petroleum diesel without the environmental detriment of sulfur emission.

In addition to a plentiful palm oil feedstock, the GOM's biofuel aspirations are abetted by a palm oil industry eager to begin biodiesel production, the interest of foreign investors, and

also by the existence of the Malaysian Palm Oil Board (MPOB). Pioneering palm biodiesel development since 1985, this government agency continues to develop efficient practices and to create new palm diesel products such as low pour point palm biodiesel, a palm biodiesel that is able to flow at lower temperatures (between -21°C and 0°C).

The GOM is still determined to further develop the palm oil industry by promoting the production and use of palm biodiesel. The Biofuel Industry Act passed in 2007 will allow an orderly development of the biofuel industry. (Please refer to MY7018 for details). The GOM has postponed temporarily the mandatory blend of 5 percent of palm olein in diesel (refered to as Envo Diesel or B5) in the domestic market. The Minister of Plantation Industries and Commodities has stated that B5 will initially be sold at a price equal to the retail price of petroleum diesel which is currently subsidized and determined by the GOM. With the current high prices in feedstock, the Envo diesel is unlikely to be commercially launched in the near future. Sources indicate that the GOM will only mandate B5 use if palm oil prices decline to low levels. It was estimated that 500,000 tons of palm olein (about only 3 percent of current palm oil production) would be required annually to fulfill the B5 mandate.

In Malaysia, the biodiesel industry has to reckon with some of the lowest fuel prices in its region. The GOM sets retail fuel prices below the market price and compensates retailers through subsidies. Increasing crude oil prices have put upward pressure on this subsidy, forcing the GOM to incrementally increase retail petroleum prices. In February 2006, protests ensued a US$0.08 per liter increase in both diesel and petroleum retail prices and fuel prices have not increased again since then. In recent days, the GOM has been looking into a subsidy payment that will benefit the right target group which is the lower income group. For a start, the GOM has banned the sale of subsidized petroleum to foreign cars in area within 50km from the borders with neighboring countries.

The GOM cancelled the sales tax on retail petroleum products to alleviate price pressure and the incidence of the sales tax borne by the retail customer. The sales tax on diesel of US$0.05 per liter was dropped since October 1999. The sales tax on gasoline of US$0.16 per liter was eliminated since June 2004.

Table 1
Retail Price of Motor Fuels in Malaysia (per liter)

	Subsidized Retail Price	Without Subsidies or Sales Tax Exemptions
Gasoline	US$0.60	US$0.96
Petroleum Diesel	US$0.49	US$0.83

US$1= Rm3.20 (May 23, 2008)

The GOM still encourages the production of methyl ester, primarily for export. New energy standards, such as those in the European Union, are making the export of methyl ester increasingly attractive to palm oil companies. The GOM is supporting the construction of biodiesel plants through tax incentives. Under the Promotion of Investments Act of 1986, biodiesel projects are eligible for Pioneer Status or Investment Tax Allowance (ITA). A company with Pioneer Status is granted tax exemption on at least 70 percent of the income derived from biodiesel production for 5 years, with more revenue being eligible under certain provisions. ITA, an alternative incentive that the companies can choose, is an allowance schedule that caters to high capital investment projects with a long gestation period. Under ITA, companies are granted an allowance of 60 percent in respect of qualifying capital expenditure incurred within 5 years of the date of the first capital expenditure. This

allowance can be used to exempt up to 70 percent of the statutory income derived from biodiesel production in the assessment year. Any unutilized allowance can be carried over to following years. Under both the Pioneer Status and ITA incentive schedules, the tax allowance increases under certain criteria such as the location of the project in a promoted area. In order to further encourage the domestic palm oil processing industry, the GOM taxes exports of crude palm oil but does not levy export duties on processed palm oil or biodiesel.

The GOM also aims to develop Malaysia's niche in palm oil biotechnology and commercialize these technological achievements. The MPOB is responsible for most of the biotechnological advances and product development in the palm oil and palm biofuel industries. The MPOB has developed many processes which it proceeds to license to the industrial sector. The processes for making low pour point palm biodiesel and methyl esters are just a few of the technologies licensed by MPOB.

BIO-FUEL MARKET SITUATION

Potential consumption of biofuel

The following tables represent the Post's estimates of the motor vehicle population in Malaysia. Registered vehicles from 1996 to 2007 were assumed to represent the current number of motor vehicles in use. From Table 4, Post estimates that diesel vehicles account for about 4.7 percent of the motor vehicle population in Malaysia.

Table 2:
Number of New Motor Vehicles Registered from 1996 to 2007

Motorcycles	Cars	Buses Taxis Hire & Drive Cars	Goods Vehicles	Others	Total
3,932,553	4,678,626	89,339	407,063	211,689	9,319,270
42.29%	50.31%	0.96%	4.38%	2.28%	100%

Source: Malaysia Road Transport Department

Table 3:
Composition of Newly Registered Motor Vehicles by Engine Type, 2005-2006

	Petrol	Diesel	Total	% Petrol	% Diesel
Motorcycle	870,961	33	870,994	100.00	0.00
Cars	944,184	2,680	946,864	99.71	0.29
Buses/Taxi/Hire & Drive Cars	8,512	641	9,153	93.00	7.00
Goods Vehicles	13,545	27,789	41,331	32.77	67.23
Others	6,573	14,843	21,416	30.69	69.31
Total	1,843,772	45,986	1,89,758	97.57	2.43

Source: Malaysia Road Transport Department

Table 4:
Estimated Number of Petrol and Diesel Motor Vehicles registered from 1996 to 2007, calculated using the 2005-2006 share of motor vehicles in each Category

	Petrol	Diesel	Total
Motorcycle	3,932,553	0	3,932,949
Cars	4,665,058	13,568	4,678,626
Buses/Taxi/Hire & Drive Cars	83,085	6,254	89,339
Goods Vehicles	133,395	273,668	407,063
Others	64,967	146,722	211,689
Total	**8,879,058**	**440,212**	**9,319,270**
Percent of Total Motor Vehicles	**95.28%**	**4.72%**	100%

Post foresees that diesel vehicles could make up a greater share of the total in the future when B5 is introduced and government incentives are promoted. The annual road tax that drivers must pay has always been significantly greater for diesel motor vehicles. One reason that diesel engines were originally taxed more heavily is because their engines were considered to release comparatively more harmful emissions into the environment. On January, 1 2007, the GOM reduced the annual road tax for petroleum vehicles with engine capacities less than 1600 cubic centimeters (c.c.) by 10 percent while the tax for diesel vehicles with engine capacities less than 1600 c.c. was reduced by 34 percent.

Table 5 Road Tax in Peninsular Malaysia 2008

Engine Capacity (c.c.)	Petrol Engine	Diesel Engine
1000 and below	US$6.25	US$6.25
1001-1200	US$17.19	US$34.38
1201-1400	US$21.88	US$43.75
1401-1600	US$28.13	US$56.25
1601-1800	US$62.63-US$87.50	US$125.25-US$175.00
1801-2000	US$87.66-US$118.75	US$175.34-US$243.75
2001-2500	US$119.06-US$275.00	US$244.44-US$562.50
2501-3000	US$275.78-US$665.63	US$589.38-US$1,525.00
3001-5000	US$667.03-US$3,478.13	US$1,528.38-US$8,275.00

US$1=Rm3.20 (May 23, 2008)

Biofuel Production

Ethanol production

There are no ethanol production plants currently operating in Malaysia. The advent of a domestic ethanol industry is highly unlikely as an appropriate ethanol feedstock is not abundantly available in Malaysia. Also, ethanol consumption is unlikely as retail gasoline prices are subsidized.

Biodiesel production in the biofuel sector

About ten Bio-diesel plants have been completed. Four of them are still in production trails. The total combined capacity should be near to a million tons. With the current high prices for feedstock, Post estimates the actual biodiesel output for the whole 2008 should be in the ballpark of 480,000 tons. The companies that are making profits are those that are changing their product-mix such as increasing the production of Vitamin E (a derivative from Crude Palm Oil) while others are looking to selling glycerin (a by-product) at higher prices.

With the current astronomical palm oil prices, the GOM has started to look at a promising alternative feedstock, *Jatropha.* It has excellent small-scale potential but needs more research before it could be cultivated on a larger-scale area. The GOM allocated US$625,000 to the Malaysian Rubber Board to develop high yield *jatropha* clones and regulate large-scale *jatropha* plantation on marginal lands. There is a possibility of intercropping *jatropha* with rubber trees or cultivating as a mono-crop on land that is not suitable for planting oil palm. Lacking the abundance of land and availability of cheap labor, Malaysia is viewed as lagging behind countries like Indonesia and India in competitiveness of growing *jatropha.* A few private companies are planning to invest in *jatropha* cultivation but the impact on the biofuel sector would not be significant in the next two years.

In the longer term, Malaysia's palm biodiesel industry continues to attract foreign investors, the latest being a tripartite venture involving Malaysia, Uganda and Libya to construct a biodiesel plant which a production capacity of 250,000 ton per annum in Negri Sembilan, Peninsular Malaysia. Johor Corp (JCorp) is developing its Tanjung Langsat industrial area in the state of Johor, next to Port Pasir Gudang and hopes to attract at least six biofuel plants to be located there. Finland's Neste Oil announced plan to build the world's largest biofuel plant with a design capacity of 800,000 tons per year in Singapore. Expected to be completed in 2010, the plant will rely on palm oil feedstock from Malaysia and Indonesia.

Table 6:

Biodiesel Projects Approved by the Malaysian Industrial Development Authority (from Jan 2007 to Feb 2008)

Company		Location	Foreign Participation
1	Keck Seng (Malaysia) Berhad	Masai, Johor	63.4% Others
2	Explorasi Kiara Sdn. Bhd.	Lahat Datu, Sabah	45.5% - U.S.A.
3	Bionew Sdn. Bhd.	Lahat Datu, Sabah	100 United Kingdom
4	Gunung Biofuel Sdn. Bhd.	Kemunting, Perak	2.5% - Singapore
5	Coremega Sdn. Bhd	Papar, Sabah	None
6	Carotino Sdn. Bhd.	Pasir Gudang, Johor	25.0% - Singapore
7	Bio Industry Venture Sdn. Bhd	Port Klang, Selangor	None
8	Wide Axis Sdn. Bhd.	Lumut, Perak	40.0% - India
9	West East Biofuel Sdn. Bhd.	Bukit Raja, Selangor	60.0% - United Kingdom
10	Batc Development Bhd.	Jempol, Negeri Sembilan	None
11	Global Bio-Diesel Sdn. Bhd.	Lahat Datu, Sabah	100% - Korea
12	Living Resources Sdn. Bhd.	Kota Kinabalu, Sabah	None

Table 6 shows the biodiesel projects currently approved by the Malaysian Industrial Development Authority (MIDA). When all these plants are operational, it is estimated that Malaysia will be able to produce nearly 2 million metric tons of biodiesel annually.

The MPOB has worked with the Ministry of Plantation Industries & Commodities as well as Malaysian plantation companies to begin oil palm plantations overseas in Indonesia, Latin America and West Africa. This will further increase the supply of palm oil for Malaysian palm biodiesel companies.

Imports Regimes for Biofuels

There are currently no import tariffs in Malaysia directly levied on biofuels. There is no import tariff on crude palm oil but there is a 5 percent duty levied on processed palm oil. There are no duties on two common biofuel feedstocks: rapeseed oil and sunflower oil. There is however a 5 percent tariff on soybean oil and its fractions.

BIOFUEL STATISTICS

Quantity of Feedstock Use in Biofuel Production in 1,000 MT					
		2005	2006	2007	2008
Biodiesel					
	Palm oil	178	346	425	510

Biodiesel production / consumption / trade (1,000 M Ton)				
	2005	2006	2007	2008
Biodiesel				
Beginning stocks	0	0	0	0
Production 1/	167	325	400	480
Imports	65	113	133	130
Total supply	232	438	533	610
Exports	152	318	485	580
Consumption	80	120	48	30
Ending stocks	0	0	0	0

1/ One ton of Palm Oil has a 94% yield in term of methyl ester output.

Imports Trade Matrix

		(1,000 MT)
Rank	**Country**	**2006**
1	Singapore	28
2	Indonesia	18
3	China	17
4	Japan	14
5	Thailand	11
6	U.S.A.	6
7	Germany	3
8	Taiwan	3
9	India	3
10	Korea, South	1
	Others	8
	--TOTAL	**112**

Imports Trade Matrix

		(1,000 MT)
Rank	**Country**	**2007**
1	Singapore	46
2	China	22
3	Thailand	12
4	United States	8
5	Indonesia	7
6	Australia	7
7	Japan	6
8	Korea, South	5
9	Germany	4
10	Taiwan	3
	Others	13
	--TOTAL	**133**

Sources: The Department of Statistics, Kuala Lumpur.

Exports Trade Matrix

		(1,000 MT)
Rank	**Country**	**2006**
1	Netherlands	115
2	U.S.A.	86
3	India	22
4	Japan	12
5	China	10
6	Germany	8
7	Korea, South	8
8	Thailand	7
9	Switzerland	6
10	Indonesia	6
	Other	38
	--TOTAL	**318**

Exports Trade Matrix

		(1,000 MT)
Rank	**Country**	**2007**
1	Netherlands	197
2	United States	136
3	India	24
4	Australia	15
5	Singapore	13
6	Japan	13
7	China	12
8	Indonesia	10
9	Thailand	9
10	Germany	9
	Other	47
	--TOTAL	**485**

Sources: The Department of Statistics, Kuala Lumpur.